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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,750	03/03/2004	Dong-Woo Cho	80800-000111/US	2879
30593	7590	01/13/2005	EXAMINER	
HARNES, DICKEY & PIERCE, P.L.C.			SHECHTMAN, SEAN P	
P.O. BOX 8910			ART UNIT	
RESTON, VA 20195			PAPER NUMBER	
			2125	

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/790,750

Applicant(s)

CHO ET AL.

Examiner

Sean P. Shechtman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-15 are presented for examination.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper."

Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered (See page 21, lines 21-27).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 8-12, and 14-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 1 recites the limitation "the reference value of the constraint variable" in lines 12-13. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 8 recites the limitation "the tool material" in line 7. There is insufficient antecedent basis for this limitation in the claim.

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6. Referring to claim 3, it is not clear if "(a node closest to a cutter)" is a required claim limitation.
7. Claim 9 recites the limitation "the tool" in line 8. There is insufficient antecedent basis for this limitation in the claim.
8. Claim 9 recites the limitation "each direction" in line 9. There is insufficient antecedent basis for this limitation in the claim.
9. Referring to claims 9-12 and 14-15, the examiner respectfully submits that all variables should be clearly defined or at least referred to as constants. For example, referring to claim 10, it is unclear what is required by the terms A1, A2, A3, A4, tc, B1, B2, B3, B4, C1, C2, C3, C4. Another example, referring to claim 9, it is unclear what is required by the terms Kn, Kf, theta, and alpha, and phi.
10. Claim 11 recites the limitation "the tool" in line 4. There is insufficient antecedent basis for this limitation in the claim.
11. Claim 11 recites the limitation "each direction" in line 5. There is insufficient antecedent basis for this limitation in the claim.
12. Claim 14 recites the limitation "the tool" in line 9. There is insufficient antecedent basis for this limitation in the claim.
13. Claim 15 recites the limitation "the tool" in line 12. There is insufficient antecedent basis for this limitation in the claim.
14. The term "and so on" in claim 4 is a relative term which renders the claim indefinite. The term "and so on" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The cutting

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configurations computed through ME Z-map modeling have been rendered indefinite by the term "and so on".

15. Regarding claim 8, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 1, 3-6, 7, 13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 4,423,481 to Reid-Green.

Referring to claims 1, 7, and 13, Reid-Green teaches an off-line feed rate scheduling method of a CNC machining process that is performed according to workpiece geometry and a given set of NC code provided from a CAD/CAM system (Abstract), the method comprising:

selecting a constraint variable and inputting a reference value related to the constraint variable (Col. 3, lines 9-45; constraint value of maximum distance d; Fig. 1, the origin);

estimating a cutting configuration where a maximum constraint variable value occurs through ME Z-map modeling (Fig. 1, Col. 3, lines 9-45; Col. 2, lines 15-38, the mathematical expression defines a cutting edge path with respect to the work surface,

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wherein the cutting edge is moved in a series of successive segments defined on the path; each segment has maximum constraint variable d);

obtaining the estimated cutting configuration and estimating a specific rotation angle where the maximum constraint variable value occurs through constraint variable modeling (Col. 3, lines 49-65);

calculating a feed rate that satisfies the reference value of the constraint variable at the estimated specific rotation angle (Col. 14, lines 5-19); and

applying the calculated feed rate to the NC code (Fig. 6, element 330; Col. 13, lines 53-57).

Referring to claim 3, Reid-Green teaches the method above, wherein computing cutting configurations through ME Z-map modeling comprises: searching for node points located in a cutting area (See fig. 1, elements 100 and 142); identifying whether a target node is an edge node or not (Col. 13, lines 24-28); calculating and updating a height value of each node in the cutting area (Col. 13, lines 29-37); moving a target node if it is an edge node and storing movement direction angles (Col. 13, lines 46-52); computing the cutting configurations using the stored angles (Col. 13, lines 53-57).

Referring to claim 4, Reid-Green teaches the method above, wherein the cutting configurations computed through ME Z-map modeling include an entry angle, an exit angle, an axial depth of cut and so on (Col. 13, lines 53-57).

Referring to claim 5, Reid-Green teaches the method above, wherein in the case where a difference between a distance from a tool center to a target node and a tool radius is smaller than a movement limit, this node is designated as an edge node (See fig. 1).

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Referring to claim 6, Reid-Green teaches the method above, wherein one of cutting force and machined surface error is selected as a constraint variable (Col. 12, lines 37-44).

Allowable Subject Matter

17. Claims 2, 8-12, 14, and 15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter: Neither Reid-Green nor the prior art of record teach calculating feed rates, reference forces, force components, or apparent variables of force component calculations using the formulae taught in claims 2, 8-12, 14, and 15.

Conclusion

19. The prior art or art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents or publications are cited to further show the state of the art with respect to offline object movement configuring based on a mathematically determined maximum movement length.

U.S. Pat. No. 4,888,707 to Shimada.

The following patents or publications are cited to further show the state of the art with respect to estimating a cutting configuration where maximum cutting force occurs through modeling.

U.S. Pat. No. 5,876,155 to Link.

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20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean P. Shechtman whose telephone number is (571) 272-3754. The examiner can normally be reached on 9:30am-6:00pm, M-F.

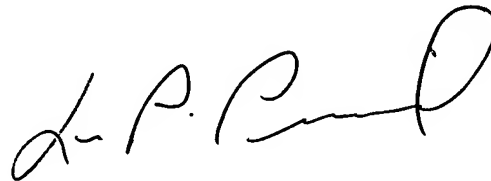
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SPS

Sean P. Shechtman

January 9, 2005

A handwritten signature in black ink, appearing to read "L. P. Picard", with a stylized, cursive flourish at the end.

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100